Dell EMC Networking update

22 December 2020

Dell Technologies Business Unit

Ein Team, viele Zahlen…

DELL Technologies
AUTHORIZED DISTRIBUTOR

DELL TECHNOLOGIES @ INGRAM MICRO

2019 IN ZAHLEN

Ärmel hochgekrempelt: Das alles stand auf der kilometerlangen ToDo-Liste des Dell Technologies Teams von Ingram Micro. Boah!

Mehr als **18.000** Angebote geschrieben.

Über **806** Stunden mit rund **17.600** Kunden telefoniert.

Ganz genau **662.206** Dell Technologies Produkte verkauft.

Das sind **100 %** mehr als noch 2018.

SALES

30 KÖPFE, 1 THEMA: die Produkte von Dell Technologies – und zwar ALLE Produkte des Dell Technologies Portfolios. Wenn schon, denn schon …

MARKETING

68 Newsletter an 193.000 Empfänger verschickt.

Mehr als 50 Blog-Posts auf mash gestellt.

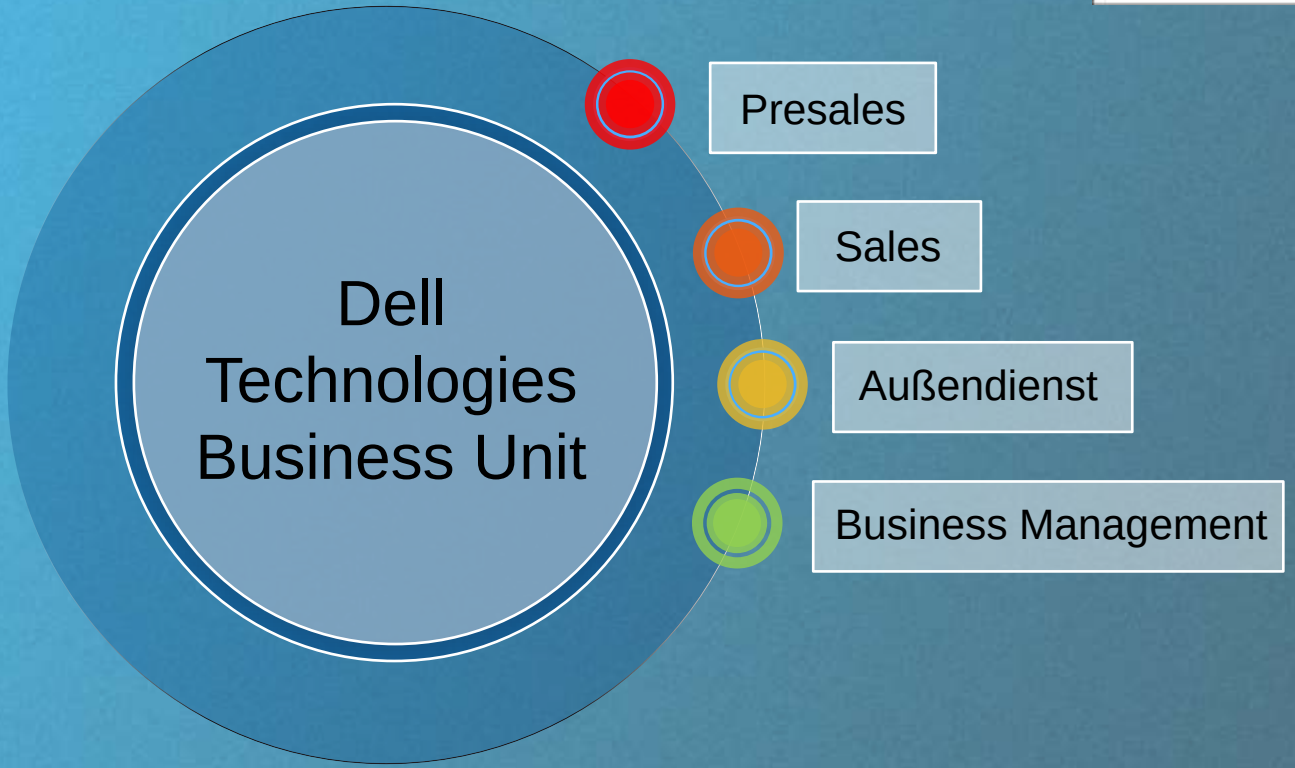
Damit fast **40.000** Seitenaufrufe erklickt.

1.080 Minuten Webcasts produziert. Dabei

820 Teilnehmer aufgeschlaut.

Alle Zahlen umfassen den Zeitraum 01.01.2019 bis 31.12.2019. Lediglich bedingt ist nicht das komplette Dell Technologies Team von Ingram Micro abgebildet.

Das Dell Technologies Team von Ingram Micro



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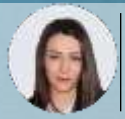

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Ein Team – eine Partnerschaft

Basics für Ihre Zusammenarbeit mit Ingram Micro& Dell Technologies

Registrierung: Dell Technologies Solution Provider

Starten Sie noch heute: DellTechnologies.com/Partner

Partnerprogramm-handbuch

Als Nächstes **füllen Sie den Partnerschaftsantrag** aus. Dieser wird von den Teams überprüft. Möglicherweise ist es erforderlich, dass Sie In Ihrem Antrag einen Sponsoringdistributor zwecks Genehmigung angeben. Vergewissern Sie sich bei der Auswahl eines Sponsoringdistributors, dass Sie bereits eine Geschäftsbeziehung mit ihm pflegen, sodass dieser die Einhaltung unserer hohen Exzellenzstandards sicherstellen und Ihre Compliance für das Dell Technologies Partnerprogramm bestätigen kann. Ihr Antrag wird möglicherweise an den angegebenen Sponsoringdistributor weitergeleitet. Ohne dessen Zustimmung können wir Ihren Antrag leider nicht weiter bearbeiten. Sie erhalten eine Benachrichtigung, wenn Ihre Mitgliedschaft genehmigt oder abgelehnt wurde.

Bevor Sie den Antrag ausfüllen, müssen Sie sicherstellen, dass Ihr gesamter Browser-Verlauf gelöscht ist und in Ihrem ausgewählten Browser beide Sprachen auf Deutsch (Deutschland) eingestellt sind. Dies sorgt für ein reibungsloses Anwendererlebnis.

Hier bewerben

Dell Technologies Partner Portal - Anwendungen

Partnerportal

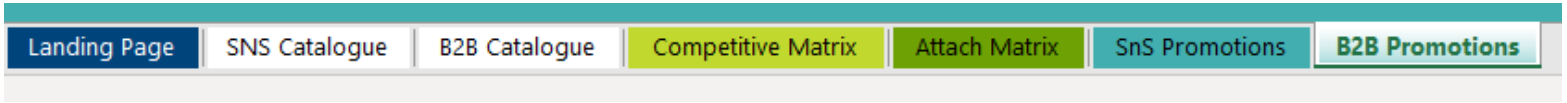
Das Dell Technologies Partnerportal ist eine zentrale Anlaufstelle für alle Ihre Programmanforderungen und bietet Zugang zu Tools und Ressourcen, darunter:

- Vertrieb, Konfiguration und Angebotserstellung
- Dealregistrierung
- Schulungen und Kompetenzen
- Produkte und Lösungen
- Marketing und Kampagnen
- Weiterverkauf von Services sowie gemeinsame oder eigenständige Bereitstellung
- Nachverfolgung für Partnerprogramm und Compliance
- Zahlungs- und Finanzierungslösungen
- Support Services für Partner
- Neuigkeiten und Veranstaltungen

Promos & Guides

Server & Netzwerk I Stock & NON-STOCK Promotions

PowerEdge Katalog:
https://www.delltechnologies.com/resources/de-de/auth/asset/quick-reference-guides/partner/dell-emc-poweredge-catalogue-de.xlsm.external



PowerSwitch Katalog:
https://www.delltechnologies.com/resources/de-de/auth/asset/playbooks/products/servers/dell_emc_powerswitch_catalogue.xlsx.external

Storage SmartValue Promotions:
Mehrwerte SmartValue Bundles

Ingram Dell Technologies Portal:

Promos & Preislisten: https://de.ingrammicro.eu/hersteller/portale/dell-technologies/resellerpreislisten

Dell EMC Networking Q4 Promos gültig bis 28.01 oder so lange Vorrat

NON-STOCK

Smart Value	VPN	Discount up to (EUR)
SD-WAN Edge 610	210-ATEO	**100**
SD-WAN Edge 620	210-ATES	**100**
VEP4600 8core 16GB	210-APGT	**100**
SD-WAN Edge 640	210-ATEN	**200**
SD-WAN Edge 680	210-ATEP	**200**
VEP4600 16core 32GB	210-APGV	**200**
SD-WAN Edge 3400	210-ATER	**400**
SD-WAN Edge 3800	210-ATEQ	**500**

Smart Value	Order codes	Discount up to (EUR)
SD-WAN Edge 610	DNSDWAN_Edge610	**100**
SD-WAN Edge 620	DNSDWAN_Edge620	**100**
VEP4600 8core 16GB	DNVEP4600_8Core16GB	**100**
SD-WAN Edge 640	DNSDWAN_Edge640	**200**
SD-WAN Edge 680	DNSDWAN_Edge680	**200**
VEP4600 16core 32GB	DNVEP4600_16Core32GB	**200**
SD-WAN Edge 3400	DNSDWAN_Edge3400	**400**
SD-WAN Edge 3800	DNSDWAN_Edge3800	**500**

Upfront discount applies (MOFF SKU to be selected)

STOCK

Smart Value	VPN	Discount (EUR)
Networking N1524P	210-AEVY	250
Networking N1548P	210-AEWB	300
Networking N2048P	210-ABNY	350
Networking N3024EP	210-APXC	250
Networking N3048EP	210-AOFM	250

Up to €500 off

Up to €350 off

Up to €500 off

NON-STOCK

Discount 500 off S-series with OS10 … S4112F/T, S4128F/T, S5212F, S5224F

- Based on 1:1 ratio (1xSwitch + 1xStorage or 1xSwitch + 1xServer)
- Promotion is eligible when attached to the latest generation of PowerEdge Servers as well as VxRail, Azure Stack HCI and/or SC/ME Storage Arrays
- **Promotion is applicable only for Smart Value offers in GII/OSC** (and is not available Online)
- **Both Server/Storage and Networking product must be sold to one reseller in one invoice**

- Non-Stock Smart Value OCs:
  DNS4112 / DNS4112F_Industry-Standard / DNS4112F_Industry-Premium / DNS4112T / DNS4128 / DNS4128F_Industry-Standard / DNS4128F_Industry-Premium / DNS4128T / DNS5212F_Entry-Level / DNS5212F_Industry-Standard / DNS5212F_Industry-Premium / DNS5224F_Entry-Level / DNS5224F_Industry-Standard / DNS5224F_Industry-Premium

Upfront discount applies (MOFF SKU to be selected)

Client Pricing

- **Promotion:**
  Monatlich wechselnde Promos ab dem ersten Stück (Sonderpreis direkt im Shop hinterlegt)

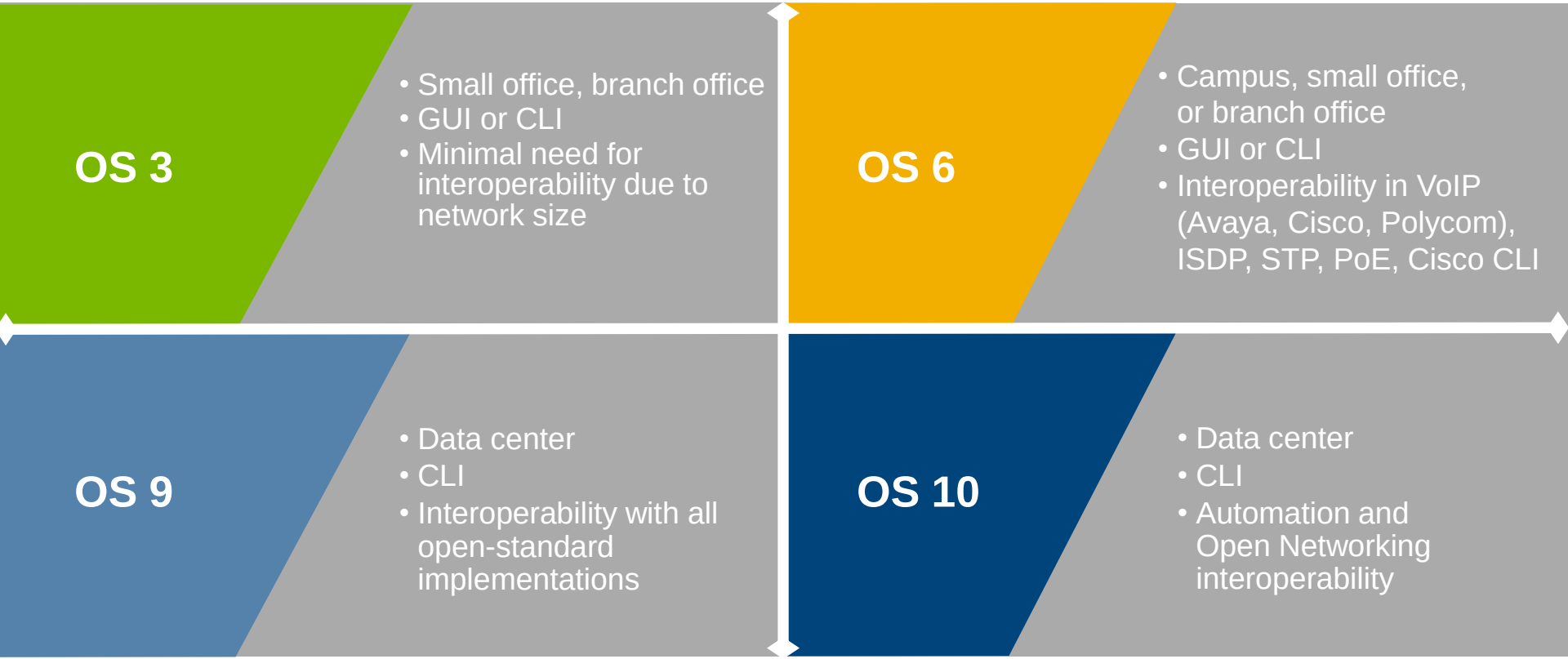
- **Staffelpreise:**
  Staffelpreise (keine Endkundendaten notwendig) ab 3 Stück bis maximal 100 Stück (Preise im Shop sichtbar)

- **Mini Bids (kleinere Projekte):**
  Preis unter Angabe der Endkundendaten ab 5 Stück bis max. 30 Stück auf Anfrage (an DellEMC@ingrammicro.com)

- **Quotes:**
  Projektanfragen ab Listprice Volumen von 10‘000€ an DellEMC@ingrammicro.com

Campus Switch Portfolio und Produktübergang

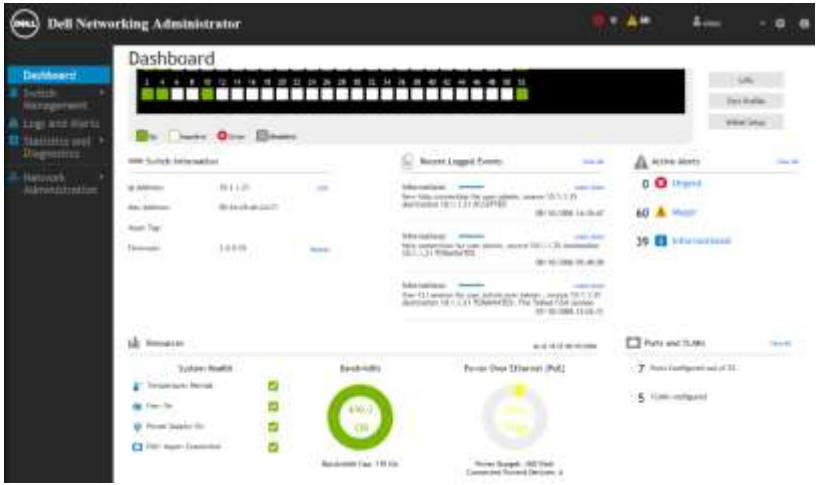
Network operating system administration



Graphical user interface (GUI)
Command line interface (CLI)

Die X-Serie… EoS

Campus Switche für den SMB Bereich. 1-10Gbit für den Access Bereich im SMB/RoBo/BO. Smartmanaged



N1100 1/10GbE campus access switch EoS

Cost-effective Open Networking switches for campus access

- **N1108T-ON/N1108P-ON** – Half-width, 8 x 10/100/1000Mbps RJ45 ports and 2 x GbE RJ45 and 2 x GbE SFP interfaces, 4 x PoE/PoE+ ports
- **N1124T-ON/N1124P-ON** – Full-width, 24 x 10/100/1000Mbps RJ45 ports and 4 x SFP/SFP+ 1/10GbE ports, 12 x PoE/PoE+ ports
- **N1148T-ON/N1148P-ON** – Full-width, 48 x 10/100/1000Mbps RJ45 ports and 4 x SFP/SFP+ 1/10GbE ports, 12 x PoE/PoE+ ports

Applications

- Cost effective migration for aging 10/100 Mbps access switches with full-featured N-series functionality
- **Open Networking** with support for ONIE
- **USB rapid deployment** to expedite switch configuration
- **Fanless design** for ultra-quiet operation
- **Energy-efficient Ethernet** plus lower power PHYs to reduce power to inactive ports and idle links

ONIE

Dell EMC Networking N1100-ON

Full & half width
form factors

PoE and non-PoE
in a range of port configurations

Die N-Serie…in voller Bewegung

Campus Switche für den Enterprise Bereich. 1-10Gbit für den Access Bereich im Campus. Kein DC! Fully Managed

N1100

N1500

N2000/2200

N210
0

N3000/3200

N3100

N4000

Campus Portfolio EOS

N2000 Standard Layer 3 EoS

Full-featured, energy-efficient 1GbE access switch

- Up to 220Gbps switching capacity
- Up to 48 x 1GbE (line rate) + 2 x 10GbE
- Up to 600 x 1GbE ports in a twelve-stack configuration stack managed as a single node

Designed for 1GbE connectivity with standard Layer 3 features

- Powerful, economical 1/10 GbE switching solution for efficient Layer 3 for end-user devices, entry-level servers and network devices

Dell EMC innovation

- Robust Layer 3 functionality (up to 256 static routes; highly configurable ACLs
- USB Rapid Deployment for fast switch configuration
- Dell Fresh Air® compliant for office environments

Dell EMC Networking N2000

Products	
Model	**Port configuration**
N2024	24x RJ45 10/100/1000 Mb ports, 2x SFP+ ports, 2 stacking ports
N2024P	24x RJ45 10/100/1000 Mb PoE+ ports, 2x SFP+ ports, 2x stacking ports
N2048	48x RJ45 10/100/1000 Mb ports, 2x SFP+ ports, 2 stacking ports
N2048P	48x RJ45 10/100/1000 Mb PoE+ ports, 2x SFP+ ports, 2x stacking ports

N3000E-ON Open Networking Layer 3 Switch EoS

Advanced-featured 1/10GbE open networking switch

- Up to 260Gbps switching capacity
- Up to 48 x 1GbE (line rate) + 4 x 10GbE
- Up to 624 x 1GbE ports in a twelve-stack configuration stack managed as a single node

Designed for advanced Layer 3 1GbE access and aggregation

- Powerful, economical 1/10 GbE switching for Layer 3 access, aggregation and dense PoE

Dell innovation

- Open Networking capable through ONIE
- Hot swap expansion module supporting dual SFP+ and dual 10GBASE-T
- Dual 80PLUS-certified hot-swappable power supply and variable speed fans

Dell Networking N3000E-ON

Products	
Model	**Port configuration**
N3024ET-ON	24x RJ45 10/100/1000 Mb ports, 2x SFP+ ports, 2 combo media ports, 2x stacking ports, 1x hot swap expansion module bay, ONIE
N3024EF-ON	24x SFP 1000 Mb ports, 2x SFP+ ports, 2x combo media ports, 2x stacking ports, 1x hot swap expansion module bay, ONIE
N3024EP-ON	24x RJ45 10/100/1000 Mb PoE+ ports, 2x SFP+ ports, 2x combo media ports, 2x stacking ports, 1x hot swap expansion module bay, ONIE
N3048E-ON	48x RJ45 10/100/1000 Mb ports, 2x SFP+ ports, 2x combo media ports, 2x stacking ports, 1x hot swap expansion module bay, ONIE
N3048EP-ON	48x RJ45 10/100/1000 Mb PoE+ ports, 2x SFP+ ports, 2x combo media ports, 2x stacking ports, 1x hot swap expansion module bay, ONIE

N3100 & N2100 Multi-Gig switches EoS

ONIE

Industry's first Open Networking switches for the Campus

Dell EMC Networking N3132PX-ON

- 24 RJ45 10/100/1000Mb PoE 60W ports
- Eight RJ45 10/100/1000/2500/5000Mb PoE 60W ports
- Four integrated 10GbE SFP+ ports
- One hot-swap expansion module bay for either 2 port 40GbE QSFP+ or 2 port stacking modules
- One hot-swap power supply (1100W AC)
- Dual hot-swap power supply bays (optional power supply available)

Dell EMC Networking N2128PX-ON (Spring 2017)

- 24 RJ45 10/100/1000Mb PoE+ auto-sensing ports (optional external power supply needed to provide power to all ports at 30.8 watts)
- Four RJ45 10/100/1000/2500Mb PoE 60W auto-sensing ports
- Two integrated 10GbE SFP+ ports
- Two dedicated rear stacking ports
- One integrated power supply (1000W AC)

Dell EMC Networking N3132PX-ON

Dell EMC Networking N2128PX-ON

Products

Model	Port configuration
N3132PX-ON	24x RJ45 10/100/1000Mb PoE 60W, 8x 2.5/5G, 32x PoE 60W, 4x SFP+, 2x stacking ports, 2x hot swap expansion module bays
N2128PX-ON	24x RJ45 10/100/1000 Mb PoE+, 2x SFP+, 4x 2.5G PoE 60W, 2x stacking ports

Campus Portfolio
was erhalten bleibt

N1108EP-ON: Layer 2 1GbE Switch

Key features and innovations

- Fanless 8 port POE switch
- Each port capable up to POE+ power
- Adapter less: Power the switch via uplinks or via standard AC
- Compact half RU width

Key use cases

- Office or meeting rooms
- Class rooms with PoE power
- Wireless LAN AP connectivity
- Video Surveillance

SKUs	Port configuration
N1108EP-ON	8x 10/100/1000Mbps half/full duplex RJ45 ports, 2x GbE RJ45 and 2x GbE SFP interfaces, 8xPOE/POE+, compact half width form factor, fanless operation

N1500 Layer 3 lite 1/10GbE access switch

Cost-effective, energy-efficient 1GbE access switch

- Up to 176Gbps switching capacity
- Up to 48 x 1GbE ports + 4 x 10GbE per switch
- Up to 200 x 1GbE ports in a four-stack configuration managed as a single node

Designed for 1GbE connectivity with Layer 3 lite features

- Cost-effective upgrade solution for aging 10/100Mbps access switches in small to mid-sized business environments

Dell EMC innovation

- Layer 3 lite functionality (up to 256 static routes; highly configurable ACLs
- USB Rapid Deployment for fast switch configuration
- Dell Fresh Air® compliant for office environments

Dell EMC Networking N1500

Products	
Model	**Port configuration**
N1524	24x RJ45 10/100/1000 Mb ports, 4x SFP+ ports for uplinks & stacking
N1524P	24x RJ45 10/100/1000 Mb PoE+ ports, 4x SFP+ ports for uplinks & stacking
N1548	48x RJ45 10/100/1000 Mb ports, 4x SFP+ ports for uplinks & stacking
N1548P	48x RJ45 10/100/1000 Mb PoE+ ports, 4x SFP+ ports for uplinks & stacking

Campus Portfolio
Neuigkeiten

N2200-ON: L3 Standard 2.5GbE MultiGig Access

Latest generation 2.5GbE Campus Access Switches

NEW!

ONIE OS6

- Cost optimized fixed form factor switches, with full scale 2.5G MultiGig on all ports and 802.3bt Type-3 (60W) PoE on subset of ports
- x86 platform based on Broadcom Hurricane 3 MG chipset
- **N2224X-ON** - 1RU, 24x1/2.5GbE RJ-45 ports
- **N2224PX-ON** - 1RU, 24x1/2.5GbE RJ-45 with 802.3bt Type-3 (60W) PoE on 12 ports and 802.3at (30W) PoE on 12 ports
- **N2248X-ON** - 1RU, 48x1/2.5GbE RJ-45 ports
- **N2248PX-ON** - 1RU, 48x1/2.5GbE RJ-45 with 802.3bt Type-3 (60W) PoE on 24 ports and 802.3at (30W) PoE on 12 ports

Purpose-built for

- 802.11ac Wave 2 WLAN deployments and 802.3bt Type-3 high power PoE applications requiring upto 60W per port.
- Ideal for Mid to Large Enterprise Campus networks, Retail deployments requiring a range of PoE devices

Dell EMC innovation

- 160G Stacking with upto 12 members
- 25G Uplinks to aggregation

Dell EMC Networking N2200-ON

2.5G Multi-Gig

25G Uplinks

N3200-ON: L3 Advanced 1GbE &10GbE MultiGig Access

NEW!

ONIE OS6

Latest generation 1GbE and 10G MultiGig Campus Access Switches

- Cost optimized fixed form factor switches, with wide range of port density options for 1G and 10G MultiGig speeds and 802.3bt Type-4 (90W) and 802.3at (30W) PoE ports
- x86 platform based on Broadcom Trident3 chipset (except N3208PX-ON based on H3MG)
- **1G Platforms:**
  - **N3224T-ON** - 1RU, 24x1GbE RJ-45 ports
  - **N3224P-ON** - 1RU, 24x1GbE 802.3at (30W) PoE ports
  - **N3224F-ON** - 1RU, 24x1GbE SFP ports
  - **N3248TE-ON** - 1RU, 48x1GbE RJ-45 ports
  - **N3248P-ON** - 1RU, 48x1GbE 802.3at (30W) PoE ports
- **10G MultiGig Platforms:**
  - **N3208PX-ON** - Compact fanless*, 4x5GbE 90W PoE and 4x1GbE 90W PoE ports
  - **N3224PX-ON** - 1RU, 24x1/2.5/5/10GbE 802.3bt Type-4 (90W) PoE ports
  - **N3248X-ON** - 1RU, 48x1/2.5/5/10GbE RJ-45 ports
  - **N3248PXE-ON** - 1RU, 48x1/2.5/5/10GbE 802.3bt Type-4 (90W) PoE ports

Dell EMC Networking N3200-ON

48 x 10G MultiGig

48 x 90W PoE

Purpose-built for

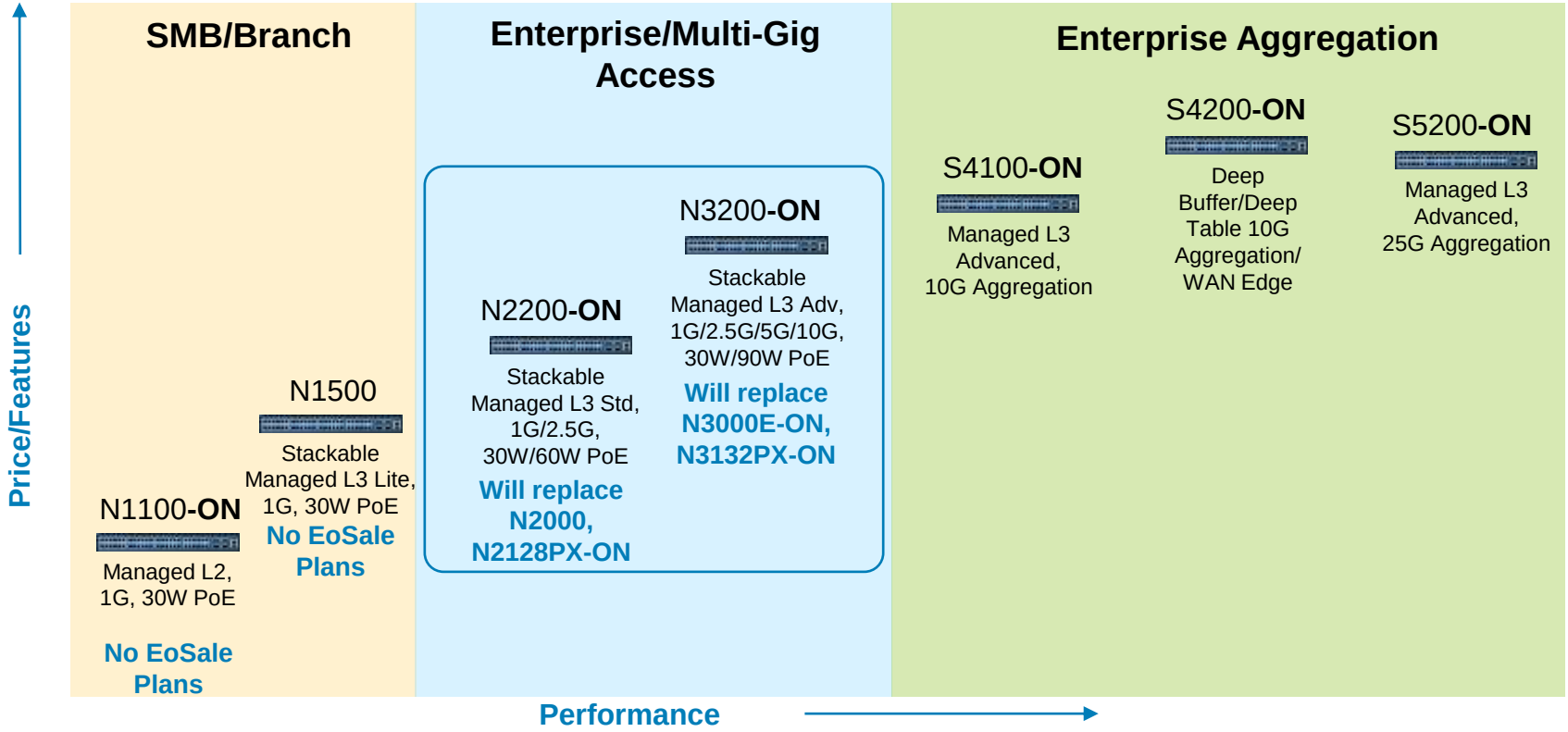
- 802.11ax WLAN deployments and 802.3bt Type-4 (90W) high power PoE applications
- Ideal for Large Enterprise Campus networks and large retail deployments

Dell EMC innovation

- **Open Networking**
- High Density (48-ports) 10G Multigig and 802.3bt Type-4 (90W) PoE
- 400G Stacking with upto 12 members
- 25G Uplinks to aggregation

*Fanless until 25C ambient, fan kickstarts beyond that ambient temperature range

Campus Switching **Positioning**



N-Series advantage—Lifetime warranty

Lifetime Limited Warranty (LLW) covers software upgrades, hardware repair or replacement, and optics and cables when purchased with the switch.	Lifetime Warranty	ProSupport	ProSupport Plus
Technical support access		24x7	24x7
Parts and labor response	NBD Parts only	NBD or Mission Critical parts &	NBD or Mission Critical parts & labor
Software and firmware updates	✓	✓	✓
TechDirect online cases and dispatch	✓	✓	✓
SupportAssist remote monitoring	✓	✓	✓
Dispatch monitoring and crisis management		✓	✓
Escalation management		✓	✓
Hypervisor and OS support		✓	✓
Collaborative 3rd party assistance		✓	✓
SupportAssist automated support		✓	✓
Direct access to elite ProSupport Plus engineers			✓
Dedicated Technical Account Manager			✓
Monthly health check and performance recommendations			✓
Monthly contract renewal and support history reporting			✓
System maintenance			✓
Cost	**included**	**$**	**$$**

Platform Deepdive
N2200 & N3200

N3200-ON Series MultiGig Platform Definitions

	8 Ports	24 Ports	48 Ports
Managed, Layer 3 Advanced	N3208PX-ON	N3224PX-ON	N3248X-ON N3248PXE-ON (with MACSec)
Downlinks	4 x 1G Cu + 4 x 1/2.5/5G Cu	24 x 1/2.5/5G/10G Cu	48 x 1/2.5/5G/10G Cu
Uplinks	2 x 10G SFP+ Ports	4 x 25G SFP28	4 x 25G SFP28
PoE Variant	8 x 802.3bt Type-4 (90W)	24 x 802.3bt Type-4 (90W)	48 x 802.3bt Type-4 (90W)
Maximum PoE Budget	720W*	2160W*	4320W*
Stacking	No	12 members, 400G, 2x100G QSFP28 ports	12 members, 400G, 2x100G QSFP28 ports
PSU	One internal open frame AC PSU and external adapter(s)	Dual internal redundant PSUs (FRUs), AC/DC options	Dual internal redundant PSUs (FRUs), AC/DC options

N3200-ON Series GiGE Platform Definitions

	24 Ports	48 Ports
Managed, Layer 3 Advanced	N3224T-ON N3224F-ON N3224P-ON	N3248TE-ON N3248P-ON
Downlinks	N3224T/P: 24 x 1G Cu N3224F: 24 x 1G SFP	48 x 1G Cu
Uplinks	4 x 10G SFP+	4 x 10G SFP+
PoE Variant	24 x 802.3at (30W)	48 x 802.3at (30W)
Maximum PoE Budget	720W*	1440W*
Stacking	12 members, 400G, 2x100G QSFP28 ports	12 members, 400G, 2x100G QSFP28 ports
PSU	Dual internal redundant PSUs (FRUs), AC/DC options	Dual internal redundant PSUs (FRUs), AC/DC options

N2200-ON Series Platform Definitions

	24 Ports	48 Ports
Managed, Layer 3 Standard	N2224X-ON N2224PX-ON	N2248X-ON N2248PX-ON
Silicon	Broadcom Hurricane 3 MG	Broadcom Hurricane 3 MG
Downlinks	24 x 1/2.5G Cu	48 x 1/2.5G Cu
Uplinks	4 x 25G SFP28	4 x 25G SFP28
PoE Variant	12 x 802.3at(30W) + 12x 802.3bt Type-3 (60W)	24 x 802.3at (30W) + 24 x 802.3bt Type-3 (60W)
Maximum PoE Budget	1080W*	2160W*
Stacking	12 members, 160G, 2x40G QSFP+ ports	12 members, 160G, 2x40G QSFP+ ports
PSU	Dual internal redundant PSUs (FRUs), AC/DC options	Dual internal redundant PSUs (FRUs), AC/DC options

Stacking – What's new

Key new benefits	N2200 (24/48 port switches only)	N3200 (24/48 port switches only)
Dedicated Rear Stacking Ports for all families	Yes	Yes
Standard ports instead of proprietary HiGig	2xQSFP+ ports (40G per port) replaces HiGig21 ports **NEW**	2xQSFP28 ports (100G per port) replaces HiGig42 ports **NEW**
Stacking without specialized cables No more short reach stacking limitation	Short reach and long reach stacking using standard QSFP+ Optics/DAC/AOCs	Short reach and long reach stacking using standard QSFP28 Optics/DAC/AOCs
2x or greater stacking bandwidth compared to previous generation	160 Gbps (vs 80Gbps) , 12 members	400 Gbps (vs 160 Gbps), 12 members

- **Stacking support within each family continues – N2200, N3200 families**
- **Stacking not backward compatible with old N-series**

PSUs – What's new

Key new benefits	N2200	N3200
Internal 2nd PSU Position cost effective N1600/N2200 class switches for 2nd internal power supply requirements	**NEW**. 24/48 port switches only No more external PSUs for redundancy and extending PoE budgets	Already supported with N3000E 24/48 port switches
Pluggable (FRU) PSUs Position cost effective N1600/N2200 class switches for Pluggable (FRU) power supply requirements	Pluggable (FRU) default PSU and 2nd PSU on all models	Already supported with N3000E 24/48 port switches

Extending PoE Budgets

	External Power Adapters	MPS-1S Shelf	MPS-3S Shelf
Supported Models	N3208PX-ON	N2224PX-ON N2248PX-ON N3248P-ON N3224PX-ON N3248PXE-ON	N2224PX-ON N2248PX-ON N3248P-ON N3224PX-ON N3248PXE-ON
Power wattage supported	Upto 2x320W on N3208PX-ON	Can support one of: 1050W AC PSU 1600W AC PSU 2000W AC PSU 1300W DC PSU	Can support upto three: • Any of the 1050W AC PSU, 1600W AC PSU, 2000W AC PSU • Or 1300W DC PSUs
Function	Can support PoE budget extension or redundancy for one switch	Can support PoE budget extension or redundancy for one switch	Can support PoE budget extension or redundancy for upto 3 switches
Mounting Options	Wall/Ceiling (Plenum rated) Rack mounting	Wall/Ceiling (Plenum rated) Rack mounting	Rack mounting
Other key features	-	-	Power sharing possible. Eg: 3x2000W PSUs can deliver 3000W to Switch 1, 1500W to Switch 2 and 1500W to Switch 3 2x1600W PSUs can deliver 1200W to Switch 1, 1000W to Switch 2 and 1000W to Switch 3 Maximum of 6000W Power that can be shared across 3 switches.

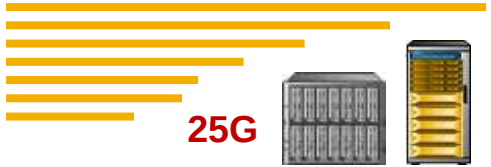
SW Feature Snapshot for next-gen N-Series

Feature	Layer 2 N1100-ON	Layer 3 Lite N1500	Layer 3 Standard N2000, N2128PX-ON, N2200-ON	Layer 3 Advanced N3000E-ON N3132PX-ON, N3200-ON
Basic Layer 2	Y	N	N	N
Static Routing	N	Y	Y	Y
RIPv1, v2	N	Y	Y	Y
VRRP	N	Y	Y	Y
MLAG/VLT	N	N	Y	Y
OSPFv2	N	N	Y	Y
OSPFv3	N	N	N	Y
IGMP/MLD	N	N	N	Y
PIM-SM/DM/SSM	N	N	N	Y
VRF	N	N	N	Y
BFD	N	N	N	Y
BGP	N	N	N	Y

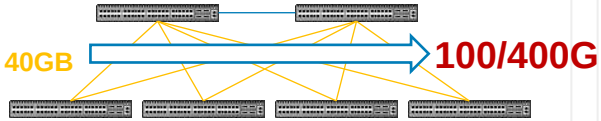
Dell Datacenter Portfolio

Heutige Netzwerke und Herausforderungen der **digitalen Transformation**

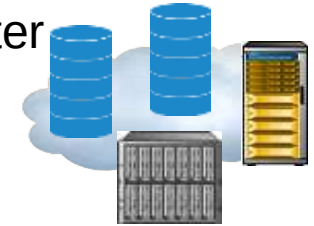
Einführung von **25G im Data Center**



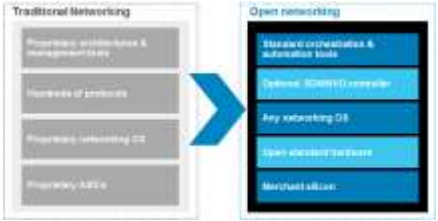
Migration von 40 zu **100/400GbE Fabrics**



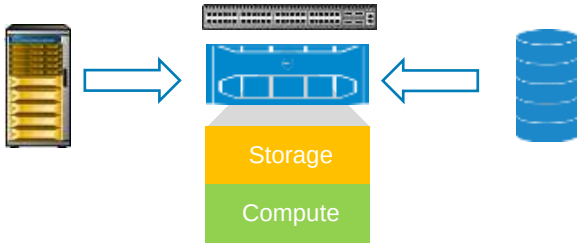
Veränderung zum **software-based** Data Center



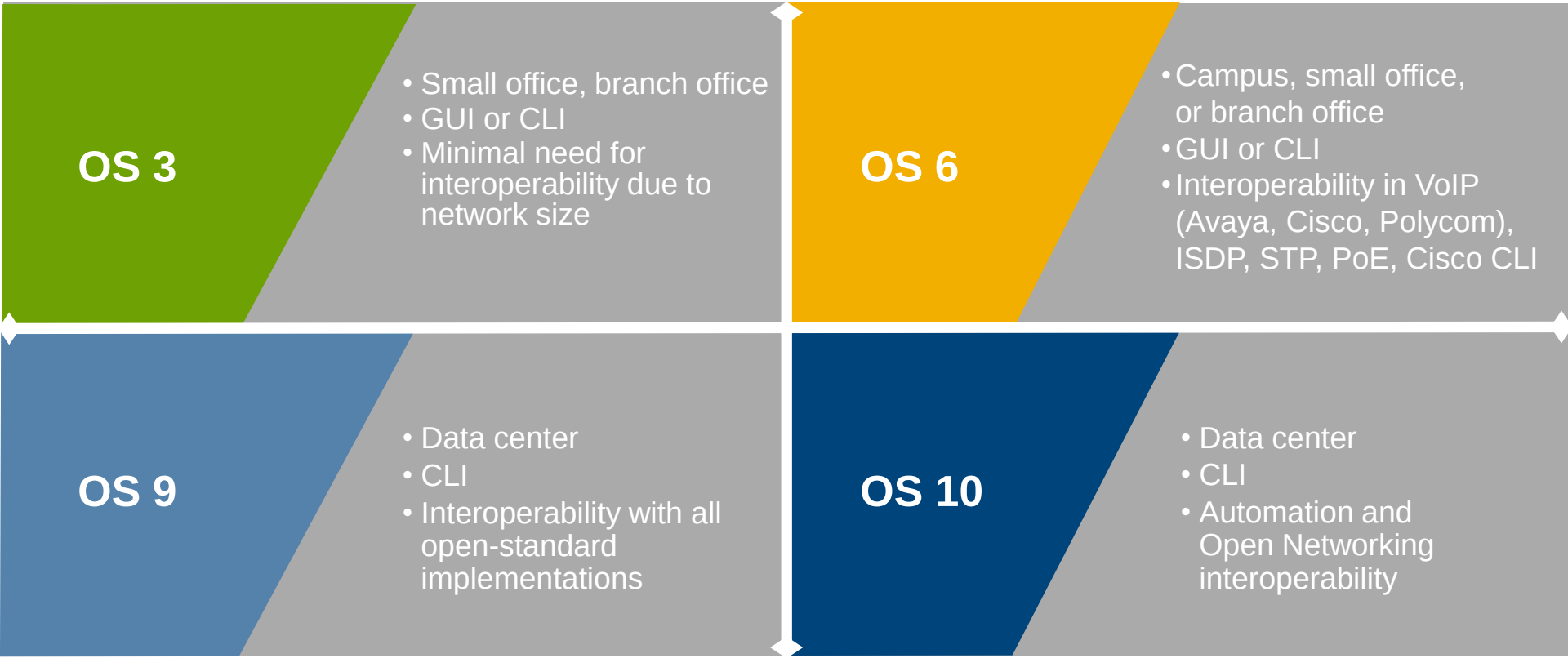
Disaggregation statt proprietäre in sich geschlossene Netzwerk Lösungen



Konvergenz im Data Center, LAN, SAN, Voice, Video



Network operating system administration



Graphical user interface (GUI)
Command line interface (CLI)

ON-Optionen: weitere offene Optionen für den Switch

DELL OS**9**

PICA8

ip infusion

SONiC

Pluribus NETWORKS

DELL OS10

ONIE

Die Vorteile dieses Konzeptes sind schnell ersichtlich, etwa eine bessere Anpassbarkeit an die Bedürfnisse des Unternehmens.

Jedes der zur Zeit angebotenen ON-Betriebssysteme erfüllt seinen **eigenen Zweck** – flexibel und jederzeit austauschbar!

Datacenter Hardware 11.2020

Shipping Now!

PowerSwitch Z9332F-ON 100/400GbE

Next Generation Z-Series Switch with 12.8Tbps of Switching Capacity

NEW

ONIE

Multi-rate fabric switch

- Fixed switch with 32 ports of 400GbE in 1RU
- System density: **32x400GbE or 128x100GbE (breakout)**
- Based on 400GbE QSFP56-DD technology
- 12.8Tbps of switching capacity (128 ports of 100GbE) (half duplex)
- 144 ports of 50GbE, 25GbE or 10GbE (in breakout mode)
- Based on **Broadcom Tomahawk3 chipset**
- Full multi-rate capabilities from 10-400GbE
- Optical breakouts with Single mode and Multimode fiber
- **OS10 EE and SONIC** feature set including complete L2/L3 stack and automation

Z9332F-ON Switch

Purpose-built for high-speed fabrics

- Ideal for high-performance enterprise and cloud **Layer 3 fabrics**
- Complete OS10 and SONIC feature set including SDN, Open Automation, and Virtualization features

Dell EMC Innovation

- **Open Networking** (ONIE)
- Multi-Rate platform (10GbE, 25GbE, 40GbE, 50GbE, 100GbE, 400GbE)

High Density 100G (128x100G)

First Generation 400G Platform

Z9264F-ON 100GbE Open Networking spine switch

High density 25/50/100GbE spine switch
State-of-the-art, high density access/aggregation open networking switch for demanding environments

- **2RU Z9264F-ON:**
  - 64 ports x 40GbE or 100GbE
  - 128 ports x 10GbE or 25GbE
  - 64 ports x 50GbE

Purpose-built for

Web2.0, enterprise, and Tier1/Tier2 cloud service provider data center networks with intensive compute and storage traffic requirements

Dell EMC innovation

- Supports **Open Networking** (ONIE) and select 3rd party OS
- Flexible & **multi-rate** (10/25/40/50/100GbE)
- Running **OS10 Enterprise Edition**
- **QSFP28-DD and QSFP28** 100G form factor with low power, cost & space

ONIE

OS10

NEW!

Dell EMC Networking Z9264F-ON

2x
Switching I/O bandwidth*

2x
Packet buffer memory*

* I/O bandwidth: Comparing Z9200 (12.8Tbps) with Z9100 (6.4Tbps), Buffers: Comparing Z9200 (42MB) with Z9100 (16MB)

Z9100 100GbE Open Networking spine switch

Multi-rate 100GbE 1RU spine switch

- Multi-rate switching
  - 32 ports x 40GbE or 100GbE
  - 128 ports x 10GbE or 25GbE
  - 64 ports x 50GbE.
  - Additional 2 fixed 1/10 GbE SFP+ ports
- Support for Dell EMC OS9.x & 3rd Party OS

Built for peak performance

- Cloud/Web2.0, HPC & Higher Ed, Government & Enterprise/Campus/DC interconnects
- Optimized for high performance, ultra-low latency Data Center requirements

Dell EMC innovation

- **Open Networking** (ONIE)
- Flexible & multi-rate (1 to 100GbE)
- QSFP28 100G form factor with low power, cost & space

Dell EMC Networking Z9100-ON

7X
Higher density per RU vs Cisco Nexus 9504*

3X
Higher density per RU vs Juniper QFX10002*

* Source: Competitive Data Sheets

RTS: 2HFY19

S5200 Series 25/100GbE in-rack switches

NEW!

Latest 25/100GbE ToR open networking switches

- Low cost fixed form factor top-of-rack switch offering multiple options of 25GbE SFP28 ports for in-rack server and storage connections and 100GbE uplink ports
- Based on Broadcom Trident3 chipset
- Enhanced buffering, higher forwarding tables and data plane support for VXLAN Routing (RIOT: Routing In and Out of Tunnels)
- **S5212F-ON** – 12 x 25GbE ports and 3 x 100GbE ports
- **S5224F-ON** – 24 x 25GbE ports and 4 x 100GbE ports
- **S5248F-ON** – 48 x 25GbE ports and 8 x 100GbE ports (4xQSFP28 +2xQSFP-DD)
- **S5296F-ON** – 96 x 25GbE ports and 8 x 100GbE ports
- **S5232F-ON** – 32 x 100GbE ports

Dell EMC Networking S5200-ON

Purpose-built for

- Optimized for combinations of **25G connections in-rack** with 100G to fabric
- Ideal for Web 2.0, Enterprise, Mid-market and cloud Service Provider
- Backwards compatible to 10/40GbE for future-proofing and migration

Dell EMC innovation

- High Density (96-port) for ToR/MoR/EoR
- QSFP-DD ports for higher density 100GbE uplink (S5248F)
- **Open Networking** running OS10 & ONIE

25G In-rack connectivity

100G Multi-rate Ports

S4100 10/100GbE in-rack switche ONIE OS**10**

Latest multi-functional, multi-protocol 10/100GbE in-rack switches

- **S4112F-ON**: 12x10GbE + 3x100G or 12x10GbE + 12x25G Ports (Breakout Mode)
- **S4112T-ON**: 12x10GBase-T + 3x100G or 12x10GBase-T + 12x25G Ports (Breakout Mode)
- **S4128F-ON -** 28 x 10G SFP+ and 2 x 100G QFSP28 ports
- **S4128T-ON** – 28 x 10GBaseT ports and 2 x 100G QFSP28 ports
- **S4148F-ON -** 48 x 10G SFP+, 2 x 40G QSFP+ ports and 4 x 100G QSFP28 ports
- **S4148T-ON -** 48 x 10GBaseT ports, 2 x 40G QSFP+ ports and 4 x 100G QSFP28 ports
- **S4148FE** – 48 x 10G SFP+ , 2 x 40G QSFP+ ports and 4 x 100G QSFP28 ports with support for LRM optics
- **S4148U: Industry's first and only 32G FC unified switch** – 24 x SFP+, 24 x unified SFP+/SFP28 ports (1/10GbE or FC8/FC16), 2 x 40G QSFP+ ports and 4 x unified QSFP28 ports (10/25G/40G/50G/100G) or FC8/FC16/FC32)

Applications

- 10/100GbE in-rack connectivity for servers and SDS environments
- Converged LAN/SAN environments to FC32

Dell EMC innovation

- Open Networking with support for OS10 & ONIE
- Fully tested and validated with 3rd party operating systems

Dell EMC Networking S4100-ON

10/100 GbE
in-rack connectivity

OS10 software environment
Programmable Linux OS

S4200 10/40/100GbE top-of-rack switches

NEW!

State-of-art deep-buffer/deep-table 10/100GbE data center switching platform

Multi-purpose 10/40/100GbE switches specifically designed for use in demanding LAN/WAN/SDN connectivity environments:

- **S4248FB-ON full-function data center switch** : 40 x 10GbE SFP+ ports + 2 x 40GbE QFSP+ ports + 6 x 100GbE QSFP28 ports
- ★ **S4248FBL-ON low-cost WAN switch or scalable 10G SDN switch**: 40 x 10GbE SFP+ ports + 2 x 40GbE QFSP+ ports + 6 x 100GbE QSFP28 ports

- **Purpose-built for top-of-rack and Data Center edge**
  - Optimized for enterprise, mid-market and Tier2 cloud data centers

Dell EMC innovation

- **Deep buffers** for **improved non-blocking workload performance** and high performance computing environments
- Optional off-chip ternary content addressable memory (TCAM) **supports deep tables** supporting expanded forwarding tables for Internet routing and scalable SDN flow rules
- **Open Networking** running OS10 & ONIE
- Fully tested and validated with **3rd party operating systems**
- Supports **long-reach optical modules**

ONIE

OS10

Dell EMC Networking S4200-ON

500x
Buffers than standard 10/100G switch

15x
Tables than standard 10/100G switch

S3048 1/10GbE in-rack switch

Latest 1/10GbE 1RU in-rack switch

- 48 x 1GBase-T & 4 x 10GbE SFP+ ports
- Built for superior efficiency & performance
- Next-generation 1G silicon for OS9.x & ON support

Purpose-built for server and storage connectivity

- Ideal for enterprise and mid-market environments with existing 1GbE installed base
- Complete OS9 feature set including SDN, Open Automation, and virtualization features

Dell EMC innovation

- **Open Networking** (ONIE)
- Fully tested and validated with 3rd party operating systems
- User Port stacking support

ONIE

Dell EMC Networking S3048-ON

1/2
Latency vs. current generation 1G ToR*

1/2
Power consumption vs. current generation*

* Source: Competitive Data Sheets

Datacenter EOS

S6100 Multi-rate modular in-rack switch

Industry's first multi-rate modular in-rack switch

- Full multi-rate capabilities from 10-100GbE
- Modules:
  - 16 x 40GbE (QSFP+)
  - 8 x 100GbE (QSFP28, 4x25)
  - 4 x 100GbE (CXP, 10x10) + 4 x 100GbE (4x25)

Purpose-built for high-speed server and storage connectivity

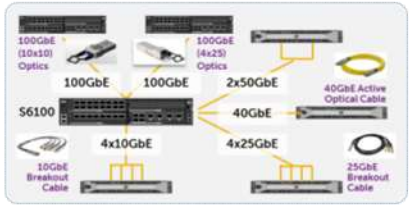
- Ideal for high-performance multi-rate enterprise and HPC environments
- Complete OS9 feature set including SDN, Open Automation, and virtualization features

Dell EMC innovation

- **Open Networking** (ONIE)
- Flexible design + multi-rate connectivity
- QSFP28 100G form factor--low power, cost & space

ONIE

Tolly. Certified



Dell EMC Networking S6100-ON

Investment Protection

Modular configuration vs fixed on Cisco Nexus 3264Q

Future-Ready

Multi-rate 10-100GbE vs 40GbE only on Cisco 3264Q

* Source: Competitive Data Sheets

S6010 High-density 10/40GbE in-rack switch

High-performance, high-density 10/40GbE 1RU in-rack switch

- 32 x 40GbE or 96 x 10GbE + 8 x 40GbE (w/breakout cables)
- New Features
  - ✓ New Broadcom Trident2+ chipset & Intel Rangeley Quad Core CPU
  - ✓ 30% more buffering, 4x larger Access Control Lists
  - ✓ Hardware ready for L3 VXLAN Gateway
  - ✓ High power optics on all ports

Purpose-built for high-speed server and storage connectivity

- Ideal for high-performance 40GbE enterprise, HPC, Cloud/Web2.0 environments

Dell EMC innovation

- **Open Networking** (ONIE)
- Energy-efficient, low power solution, fresh air capable

* Source: Competitive Data Sheets

ONIE

Miercom PERFORMANCE VERIFIED

Dell EMC Networking S6010-ON

30%
Higher buffering vs. current generation

4x
Larger ACLs vs. current generation

S5048 25/100GbE in-rack switch

Latest multi-rate 25GbE open networking switch

- Low cost fixed form factor top-of-rack 1RU switch offering 25GbE ports for in-rack server and storage connections and 100GbE ports for uplink and clustering
- **S5048F-ON** – 48 x 25GbE SFP28 ports + 6 x 100GbE QSFP28 ports or 72 x 25GbE ports in breakout mode
- Each QSFP28 port can support **multi-rates** including 10/25/40/50/100GbE
- Broadcom Tomahawk+ chipset
- DCB-enabled, VLT support, VXLAN, and L2/L3 switching

25G ports

ONIE

OS9

NEW!

25G Ethernet 50G Consortium

Purpose-built for

- Optimized for **25G connections in-rack** with 100G to fabric
- Ideal for Web 2.0, Enterprise, Mid-market and tier2 cloud and NFV service provider data center networks

Dell EMC innovation

- **Direct SFP28 fiber connections** to Dell EMC 14G servers and iSCSI storage with no need for breakouts
- Ease of migration to 25G and 100G ports with backward-compatibility to existing 10G & 40G connections
- **Powered by OS9** and supports ONIE
- Fully tested and validated with 3rd party operating systems

Dell EMC Networking S5048F-ON

25G
Improved serviceability - no breakouts

OS9
For existing customers running OS9

S5148F 25/100GbE in-rack switch

Multi-rate 25GbE open networking switch

- Low cost fixed form factor top-of-rack switch offering new 25GbE SFP28 ports for in-rack server and storage connections and 100GbE QSFP28 ports for uplink and clustering
- **S5148F-ON** – 48 x 25GbE ports + 6 x 100GbE ports or 72 x 25GbE ports in breakout mode
- Each QSFP28 port can support **multi-rates** including 10/25/40/50/100GbE

Purpose-built for

- Optimized for **25G connections in-rack** with 100G to fabric
- Ideal for Web 2.0, Enterprise, Mid-market and cloud Service Provider data center networks

Dell EMC innovation

- **Direct SFP28 fiber connections** to Dell EMC 14G servers and iSCSI storage with no need for breakouts
- **Highly programmable** – for future-proof support
- **Open Networking** running OS10 & ONIE
- Fully tested and validated with 3rd party operating systems

25G
ports

ONIE

OS**10**

25G Ethernet 50G Consortium

Dell EMC Networking S5148F-ON

25G
in-rack connectivity

OS10EE
Dell EMC Linux OS

S4048 10/40GbE in-rack switch

Latest 10/40GbE 1RU in-rack switch

- 48 x 10GbE & 6 x 40GbE QSFP ports
- 72 x 10GbE ports
- Advanced features VXLAN, larger tables, expanded buffering vs. current generation

Purpose-built for server and storage connectivity

- Ideal for high-performance 10GbE enterprise, mid-market and HPC environments
- Cloud/Web2.0 Open Networking environment
- Complete OS9 feature set including SDN, Open Automation, and virtualization features

Dell EMC innovation

- **Open Networking** (ONIE)
- Fully tested and validated with 3rd party operating systems

ONIE

Dell EMC Networking S4048-ON

1/2
Switching latency vs. Cisco Nexus 5672

1/2
Power draw vs. Cisco Nexus 5672

* Source: Competitive Data Sheets

S4048T 10G-BaseT in-rack switch

Latest 10GBase-T 1RU in-rack switch

- 48 x 10GBase-T + 6 x 40GbE QSFP+ ports or 24 x 10GbE SFP+ with breakout cables
- DCB-enabled, VLT support, stacking, hardware ready for L3 VXLAN Gateway, larger tables, expanded buffering

Purpose-built for server and storage copper connectivity

- Ideal for high-performance 10GBase-T enterprise, mid-market and HPC environments
- Cloud/Web2.0 Open Networking environment
- Complete OS9 feature set including SDN, Open Automation, and virtualization features

Dell EMC innovation

- **Open Networking** (ONIE)
- Fully tested and validated with 3rd party operating systems

ONIE

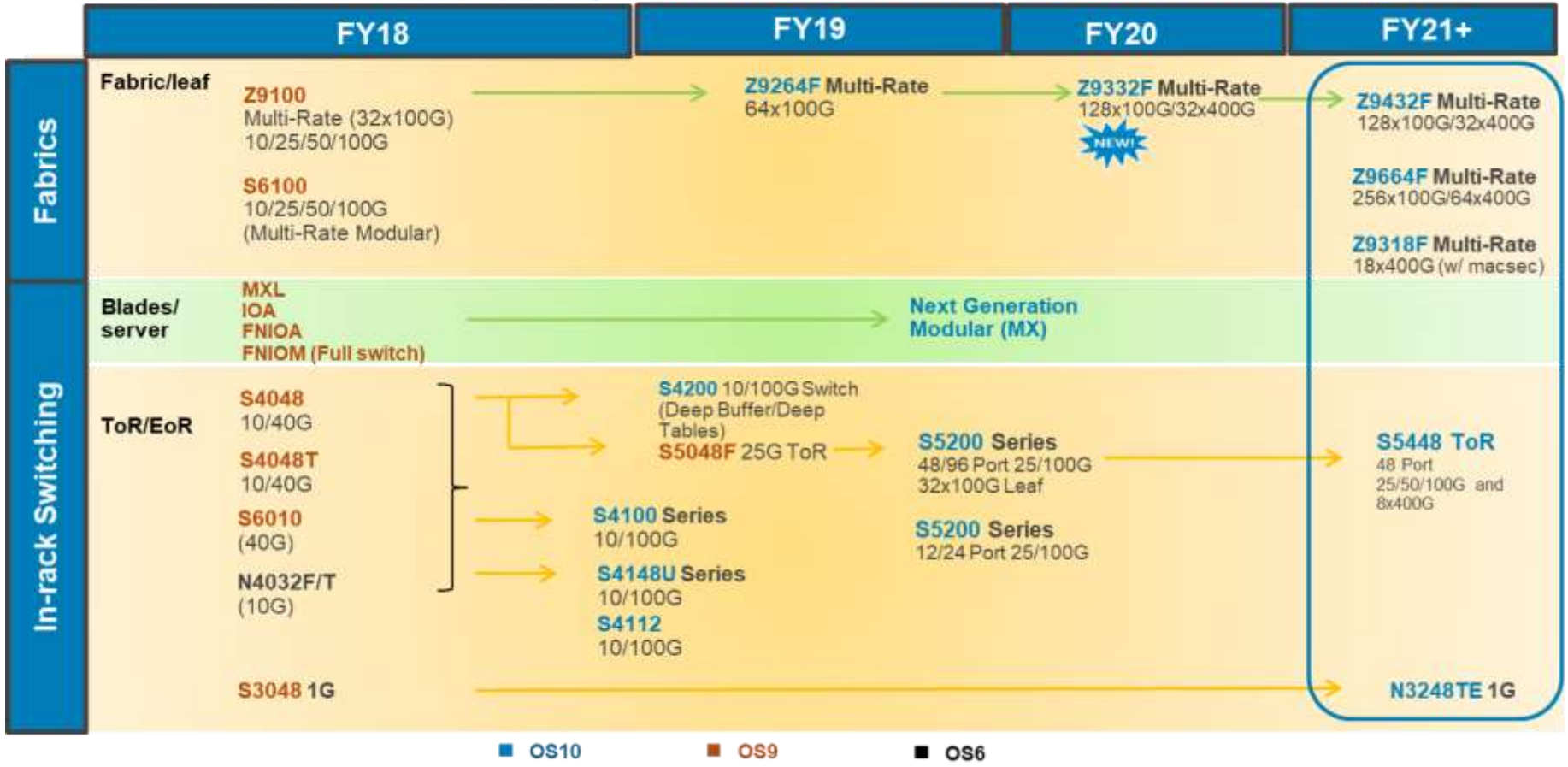
Energy Efficient Ethernet

Dell EMC Networking S4048T-ON

40%
Higher buffering vs. current generation

50%
Lower latency vs. current generation

Data Center Networking **Platforms Directional Roadmap**



Dell EMC Open Networking portfolio

Fabric/Spine switches

Z series

Top-of-rack/Leaf switches

S series

Module I/O

MX modules for MX7000

FN-IOM for FX2

MXL/IOA for M1000e

Next-generation access

Virtual Edge Platform

Campus/Branch switching

N series

Wireless networking

Aerohive and Ruckus

Networking software

DELL EMC OS6 OS9 OS10

big switch networks

cumulus networks

Pluribus NETWORKS

vmware NSX

PICA8

Ecosystem partners

puppet labs

ANSIBLE

CHEF

velocloud™

VERSA NETWORKS

paloalto networks.

Nützliche Tools

Cable und Transceiver guides

https://www.delltechnologies.com/resources/de-de/auth/asset/quick-reference-guides/products/networking/Dell_Networking_Optics_and_Cables_Interop_Matrix.xlsx.external

https://www.delltechnologies.com/resources/de-de/auth/asset/quick-reference-guides/PowerEdge_Server_Adapter_Matrix.xlsx.external

Virtuelles Rack

https://esgvr.dell.com/

Networking Solutions Support Matrix

https://infohub.delltechnologies.com/l/networking-support-matrix-1/networking-solutions-support-matrix-1

Fabric Design Center

https://fdc.emc.com/#!/network-fabric

Optics & Cables

1/10/25 Gbit SFP/SFP+/SFP28

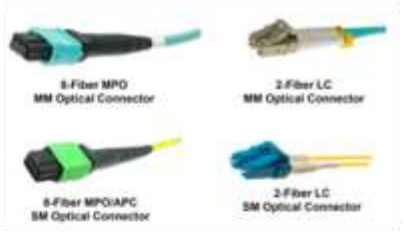

2-Fiber LC
MM Optical Connector


2-Fiber LC
SM Optical Connector

Gigabit Ethernet SFP transceivers				
SFP-1G-SX	duplex LC	850	MMF OM1 MMF OM2 MMF OM3 MMF OM4	300 m 500 m 500 m 500 m
SFP-1G-LX	duplex LC	1310	SMF	10 km
SFP-1G-ZX	duplex LC	1310	SMF	80 km

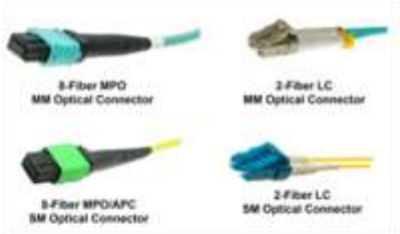
25-Gigabit Ethernet SFP28 transceivers				
SFP-25G-SR	duplex LC	850	MMF OM3 MMF OM4	70 m 100 m
SFP28-25G-ESR*	duplex LC	850	MMF OM3 MMF OM4	200 m 300 m
SFP28-25G-LR	duplex LC	1310	SMF	10 km

10-Gigabit Ethernet SFP+ transceivers				
SFP-10G-USR	duplex LC	850	MMF OM1 MMF OM2 MMF OM3 MMF OM4	10 m 25 m 100 m 150 m
SFP-10G-SR	duplex LC	850	MMF FDDI MMF OM1 MMF OM2 MMF OM3 MMF OM4	26 m 33 m 82 m 300 m 400 m
SFP-10G-LRM	duplex LC	1310	MMF FDDI MMF OM1 MMF OM2 MMF OM3 MMF OM4	220 m
SFP-10G-LR	duplex LC	1310	SMF	10 km
SFP-10G-ER	duplex LC	1550	SMF	40 km
SFP-10G-ZR	duplex LC	1550	SMF	80 km
SFP-10G-DWDM	duplex LC	1528.7 to 1568.7	SMF	80 km



40 Gbit QSFP+

40-Gigabit Ethernet QSFP+ transceivers					
QSFP-40G-SR4	MPO-12	850	MMF OM3 MMF OM4	100 m 150 m	Breakout mode möglich
QSFP-40G-ESR4	MPO-12	850	MMF OM3 MMF OM4	300 m 400 m	Breakout mode möglich
QSFP-40G-LM4	duplex LC	1271 1291 1311 1331	MMF OM3 MMF OM4 SMF	140 m 160 m 1 km	
QSFP-40G-SM4	duplex LC	850 880 910 940	MMF OM3 MMF OM4	300 m 300 m	
QSFP-40G-BIDI	duplex LC	850 900	MMF OM3 MMF OM4	100 m 150 m	
QSFP-40G-PSM4-LR	MPO-12	1310	SMF	10 km	Breakout mode möglich
QSFP-40G-LR4	duplex LC	1271 1291 1311 1331	SMF	10 km	
QSFP-40G-ER4	duplex LC	1271 1291 1311 1331	SMF	40 km	



100 Gbit QSFP28

100-Gigabit Ethernet QSFP28 transceivers				
Q28-100G-SR4	MPO-12	850	MMF OM3 MMF OM4	70 m 100 m
Q28-100G-ESR4*	MPO-12	850	MMF OM3 MMF OM4	200 m 300 m
Q28-100G-SWDM4*	duplex LC	850 880 910 940	MMF OM3 MMF OM4	75 m 100 m
Q28-100G-PSM4-IR	MPO-12	1310	SMF	2 km
Q28-100G-CWDM4	duplex LC	1271 1291 1311 1331	SMF	2 km
Q28-100G-LR4	duplex LC	1296 1300 1305 1309	SMF	10 km

Breakout mode möglich

Breakout mode möglich

Breakout mode möglich

DELL EMC NETWORKING TRANSCEIVERS AND CABLES

DELL EMC

Features and benefits

- Hot-swappable for simplified maintenance (no power-down required for installation or replacement)
- Some of the smallest and lowest power 10GbE, 25GbE, 40GbE and 100GbE optical form factors in the industry
- Optical interoperability with SFP, SFP+ and selected QSFP modules
- Offers "pay-as-you-use" model for lower total cost of ownership (TCO) and ease of technology migration
- Reliability ensured by rigorous optics validation, qualification and certification
- Dell EMC product specification encoding feature allows Dell EMC Networking platforms to recognize certified and supported transceivers
- Guaranteed to work with Dell EMC Networking platforms under temperature and process variations with optimal performance

Dell EMC provides optical and cabling options for each Ethernet speed. Long- and short-range optical connectivity options are suited to a wide range of data center and campus applications. For the shortest connections, passive copper direct attach cable (DAC) is a simple and cost-effective solution.

1GbE solutions
1GbE SFP optical transceivers include short-reach (SX), long-reach (LX) and extended long-reach (ZX). A 1000BASE-T transceiver facilitates twisted pair copper connections.

10GbE solutions
10GbE SFP+ optical transceivers include short-reach-bis (USR), short-reach (SR), long-reach (LR) and extended long-reach (ER and ZR). The 10GbE SFP+ receptacle will also recognize 1GbE SFP transceivers. An LRM transceiver supports links up to 220m over older OM2 and OM3 grade multimode fiber. A 10GBASE-T transceiver facilitates twisted pair copper connections.

25GbE solutions
25GbE SFP28 optical transceivers include short-reach (SR) and long-reach (LR) variations. In 25GbE networking environments, the 100GbE ports on our Z9100-ON, S6100-ON, S4048-ON and S4148-ON switches can be broken out into four 25GbE lanes by use of either active optical (AOC) or passive copper (DAC) breakout cables.

40GbE solutions
40GbE (4x10GbE) QSFP+ optical transceivers include short reach (SR4), long-reach (LR4) and extended long-reach (ER4). In many cases, 1GbE SFP and 10GbE SFP+ optics can be readily inserted, recognized and utilized in the 40GbE QSFP+ receptacle through the use of a (QSA) pluggable adapter. The adapter supports standard SFP and SFP+ optics in a QSFP+ socket providing backwards compatibility while preserving the 40GbE port for future bandwidth expansion.

40GbE QSFP+ ports support both optical and passive copper (DAC) breakout cables where the four 10GbE lanes are broken out into four individual 10GbE SFP+ interfaces. This solution can be deployed with a single active optical cable (AOC) with integrated QSFP+ and SFP+ transceivers or through the use of a passive fiber breakout cable/multiplexer.

Dell EMC enables cost-savings through the reuse of a legacy 10GbE fiber plant to support new 40GbE connections with our 40GbE duplex (multimode) fiber solutions. These solutions use wavelength multiplexing (SWM) and/or directional multiplexing (BiDi) to transport 40GbE over a single (multimode) fiber pair.

50GbE solutions
50GbE is a relatively new specification utilizing half-populated QSFP28 modules. In 50GbE networking environments, the 100GbE ports on our Z9100-ON, S6100-ON, S4048-ON and S4148-ON switches can be broken out into two pairs of 2x50GbE through a QSFP28 to 2xQSFP28 passive copper direct attach breakout cable (breakout DAC). (The QSFP28 is a half-populated QSFP28 with 2x25GbE lanes.)

100GbE solutions
100GbE (4x25GbE) QSFP28 optical transceivers include short reach (SR4), intermediate-reach (CWDM4), long-reach (LR4) and extended long-reach (ER4-lite). Standard 1GbE SFP+ and 25GbE QSFP28 optics can be readily inserted, recognized, and utilized in the 100GbE QSFP28 receptacle through the use of a (QSA28) pluggable adapter. Although this reduces the effective throughput of the 100GbE port to 25GbE, it provides an immediate low-cost transceiver solution while preserving the option for later bandwidth expansion.

100GbE QSFP28 ports support both optical and passive copper breakout cables. Each of the four 25GbE lanes can be broken out into four individual SFP28 interfaces. This solution can be deployed with a single active optical cable (AOC) with integrated QSFP28 and SFP28 transceivers or through the use of a passive fiber breakout cable/multiplexer.

DELL EMC TRANSCEIVERS

Model	Connector type	Wavelength(s) (nm)	Transmission medium	Distance (max.)	Transmitter power (dBm)	Receiver power (dBm)	Power dissipation (max.; W)	Notes
10G Fibre Channel SFP+ transceivers								
SFP-10GFC-SW	duplex LC	850	MMF OM3 MMF OM4	100 m 125 m	-7.9 to 0.5	-9.9 to 0.5	1.0	
SFP-10GFC-LR*	duplex LC	1310	SMF	10 km	-6.0 to 2.0	-10.0 to +2.0	1.2	
Quad 16G Fibre Channel QSFP+ transceivers								
QSFP-64GFC-SW4	MPO-12	850	MMF OM3 MMF OM4	100 m 125 m	-7.8 to 0.0 /lane	-9.5 to 0.0 /lane	3.5	compatible with 4 x 16GFC, 4 x 8GFC or 4 x 4GFC
25-Gigabit Ethernet SFP28 transceivers								
SFP-25G-SR	duplex LC	850	MMF OM3 MMF OM4	70 m 100 m	-9.1 to 0.0	-11.0 to 0.0	1.2	
SFP28-25G-ESR*	duplex LC	850	MMF OM3 MMF OM4	200 m 300 m	-7.3 to 0.0	-11.9 to 0.0	1.2	
SFP28-25G-LR	duplex LC	1310	SMF	10 km	-7.0 to +2.0	-14.5 to +2.0	1.2	
Quad 32G Fibre Channel QSFP28 transceivers								
QDR-128GFC-SW4	MPO-12	850	MMF OM3 MMF OM4	85 m 100 m	-8.5 to +2.4 /lane	-10.4 to +2.4 /lane	3.5	compatible with 4 x 32GFC or 4 x 16GFC
40-Gigabit Ethernet QSFP+ transceivers								
QSFP-40G-SR4	MPO-12	850	MMF OM3 MMF OM4	100 m 150 m	-7.6 to +2.4 /lane	-9.0 to +2.4 /lane	1.5	can operate in 1 x 4 breakout mode
QSFP-40G-ESR4	MPO-12	850	MMF OM3 MMF OM4	300 m 400 m	-4.3 to -1.0 /lane	-6.1 to -1.0 /lane	1.5	can operate in 1 x 4 breakout mode
QSFP-40G-LM4	duplex LC	1271 1291 1311 1331	MMF OM3 MMF OM4 SMF	140 m 160 m 1 km	-7.0 to +4.3 /lane (MMF) -10.0 to +2.3 /lane (SMF)	-10.0 to +4.3 /lane (MMF) -13.7 to +2.3 /lane (SMF)	3.5	
QSFP-40G-SM4	duplex LC	850 880 910 940	MMF OM3 MMF OM4	300 m 300 m	-4.8 to +2.4 /lane	-4.8 to +10 /lane	1.5	
QSFP-40G-BIDI	duplex LC	850 900	MMF OM3 MMF OM4	100 m 150 m	-4.0 to +5.0 /lane	-9.0 to +5.0 /lane	3.5	
QSFP-40G-PSM4-LR	MPO-12	1310	SMF	10 km	-5.5 to +1.5 /lane	-10.6 to +1.5 /lane	3.5	can operate in 1 x 4 breakout mode
QSFP-40G-LM4	duplex LC	1271 1291 1311 1331	SMF	10 km	-7.0 to +2.3 /lane	-15.7 to +2.3 /lane	3.5	
QSFP-40G-ER4	duplex LC	1271 1291 1311 1331	SMF	40 km	-2.7 to +4.5 /lane	-21.2 to -4.5 /lane	3.5	links longer than 30 km are considered engineered links
QSA-QSFP-SFP+	SFP+	N/A	N/A	N/A	N/A	N/A	N/A	adapter to use SFP+ modules in QSFP+ receptacles

DELL EMC NETWORKING TRANSCEIVERS AND CABLES

http://i.dell.com/sites/doccontent/shared-content/data-sheets/en/Documents/Dell-Networking-Optics-Spec-Sheet.pdf

PRODUCT SUPPORT *

10-GbE transceivers	SFP-10G-USR	SFP-10G-SR	SFP-10G-LR	SFP-10G-LRM	SFP-10G-ER	SFP-10G-ZR	SFP-10G-T-DWDM	SFP-10G-T10
Z9100-ON	✓	✓	✓		✓	✓	✓	✓
S6100-ON	✓	✓	✓		✓	✓	✓	✓
S6010-ON		✓	✓		✓	✓	✓	✓
S5000		✓	✓		✓	✓	✓	✓
S4048T		✓	✓		✓	✓	✓	✓
S4128-ON / S4148-ON	✓	✓	✓	✓***	✓	✓		
S4048 / S4048-ON		✓	✓		✓	✓	✓	✓**
N4000	✓	✓	✓	✓	✓	✓		
X4012	✓	✓	✓		✓	✓		
N2128-ON	✓	✓	✓		✓	✓		
N3132-ON	✓	✓	✓		✓	✓		
S31XX	✓	✓	✓	✓	✓	✓	✓	
S5048		✓*	✓*		✓*	✓*	✓*	✓**
S5148		✓*	✓*		✓*	✓*	✓*	✓**
N20XX / N30XX	✓	✓	✓	✓	✓	✓		
S3048-ON	✓	✓	✓	✓	✓	✓	✓	
X1052	✓	✓	✓		✓			
MXL & IO Agg		✓	✓	✓	✓		✓	
VRTX IOA & MXL		✓	✓					
FN IOM pass-through		✓	✓	✓			✓	
M8024-K		✓	✓	✓				
M6220		✓	✓	✓				
M8348		✓	✓	✓				
10Gb Pass-thru-K		✓	✓					
C-Series 36pt 1000BASE-T (and PoE) Comb Line Card: 2 10Gb SFP+ ports		✓	✓		✓			
C-Series 8 pt 10Gb SFP+ Line Card		✓	✓	✓	✓			
C9010	✓	✓	✓	✓	✓	✓	✓	

Fabric Design Center

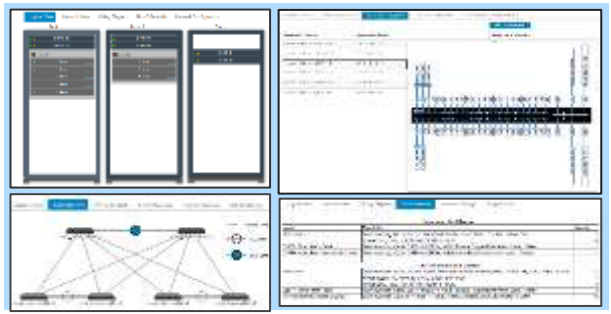
Fabric Design Center

Automated Network Design, Deployment and DevOps Integration

1 Choose the reference architecture

2 Size the deployment

3 Get the complete network design, wiring diagrams & bill of materials



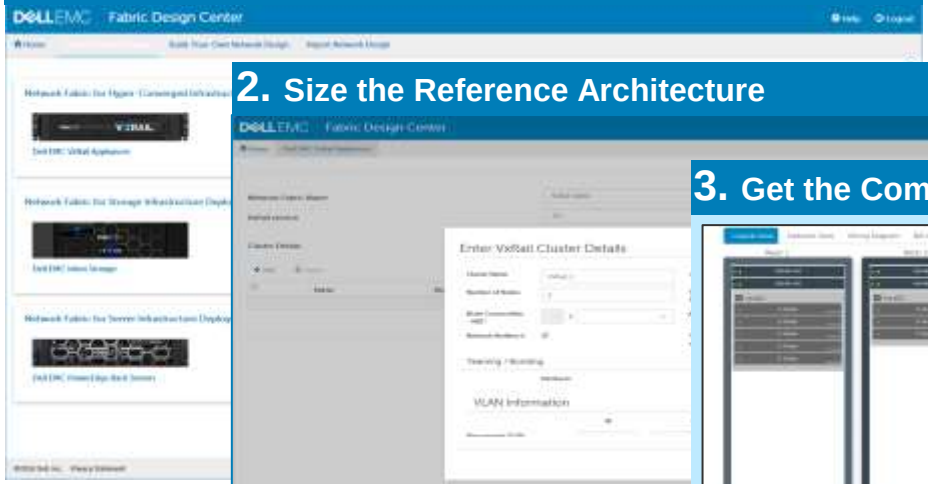
4 Download configurations and deploy network fabric or download Ansible Playbooks for DevOps Integration

FDC a Network Design Wizard

fdc.emc.com

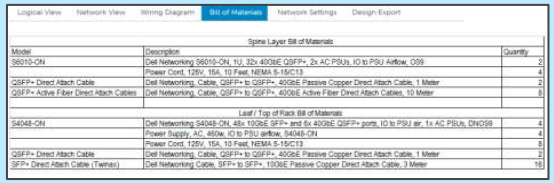
Fabric Design Center Workflow

1. Choose the Reference Architecture



2. Size the Reference Architecture

3. Get the Complete Design, Wiring Diagrams & Bill of Materials

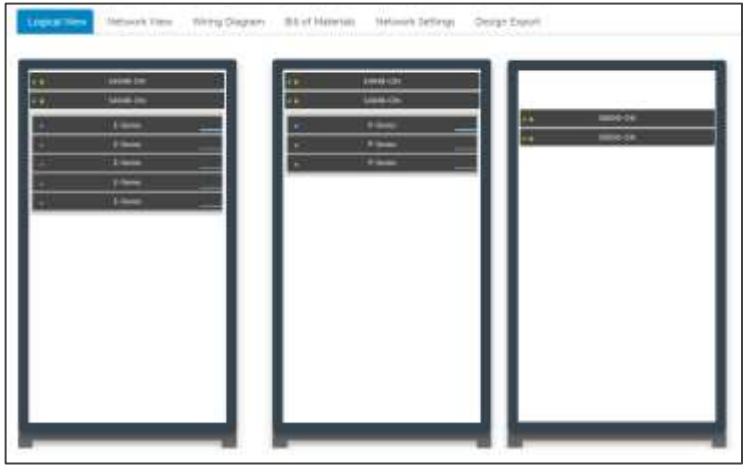


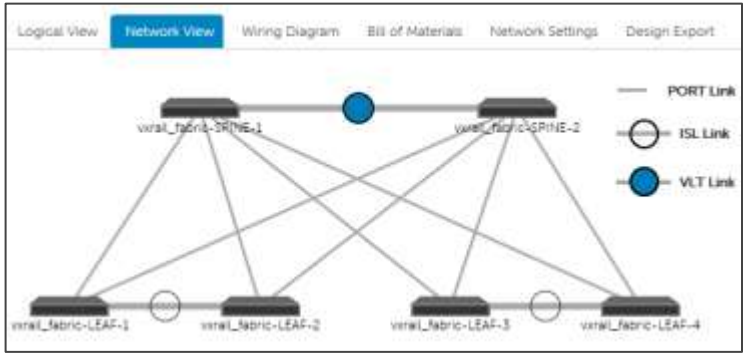
Cloud-based design wizard that abstracts and automates the planning, design and deployment of network fabrics

4. Download Configurations and Deploy Network Fabric

Fabric Design Center

https://fdc.emc.com





Logical View | Network View | Wiring Diagram | **Bill of Materials** | Network Settings | Design Export

Spine Layer Bill of Materials		
Model	Description	Quantity
S6010-ON	Dell Networking S6010-ON, 1U, 32x 40GbE QSFP+, 2x AC PSUs, IO to PSU Airflow, OS9	2
	Power Cord, 125V, 15A, 10 Feet, NEMA 5-15/C13	4
QSFP+ Direct Attach Cable	Dell Networking, Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 1 Meter	2
QSFP+ Active Fiber Direct Attach Cables	Dell Networking, Cable, QSFP+ to QSFP+, 40GbE Active Fiber Direct Attach Cables, 10 Meter	8
Leaf / Top of Rack Bill of Materials		
S4048-ON	Dell Networking S4048-ON, 48x 10GbE SFP+ and 6x 40GbE QSFP+ ports, IO to PSU air, 1x AC PSUs, DNOS9	4
	Power Supply, AC, 460w, IO to PSU airflow, S4048-ON	4
	Power Cord, 125V, 15A, 10 Feet, NEMA 5-15/C13	8
QSFP+ Direct Attach Cable	Dell Networking, Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 1 Meter	2
SFP+ Direct Attach Cable (Twinax)	Dell Networking Cable, SFP+ to SFP+, 10GbE Passive Copper Direct Attach Cable, 3 Meter	16


TWENTY QUESTIONS
HERB
VAN
FLORENCE
ALDO RAY

Danke für ihre Teilname